TECHNIC OF PARTIAL COLECTOMY BY THE MIKULICZ TWO-STAGE METHOD

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In the Annals of Surgery for February, 1920, the writer published an article on "The Advantages of the Mikulicz Two-stage Operation of Partial Colectomy." The references to this article have been mainly of two varieties: one, communications from a number of experienced sur-

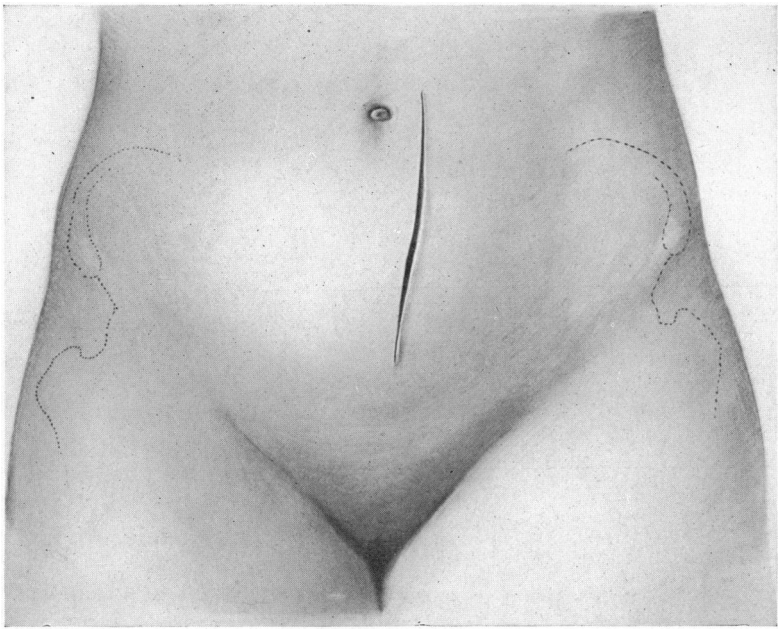

Fig. 1.—Primary incision. Used for exploration, mobilization of intestine and for removal or mobilization of enlarged lymphatics.

geons acknowledging the advantages of the principle of "exteriorizing" the growth before the intestine is opened; the other, requests for information about various details of operative technic.

There have been so many inquiries of the latter type that it seems advisable to publish a further description of this technic by giving the details of a single illustrative case of partial colectomy for cancer at the sigmoid. This is done in the hope of further popularizing an operation which diminishes the dangers of patients with cancers of the large intestine between the hepatic flexure and the lower sigmoid or with other lesions which call for partial colectomy in this region.

In the previous article, sixteen cases of partial colectomy were reported, with one death. Since that time the writer has successfully operated upon three additional cases; one for cancer of the transverse colon, one for Hirschsprung's disease, and one for cancer of the sigmoid. This low mortality rate in a short series of cases indicates the comparative safety of the procedure, but it should not mislead the reader. Individual operators continually have short series of cases which give better results than can be maintained in long series.

History of Patient.—Mrs. D. C., a rather thin woman, aged thirty-two years, came to the Roosevelt Hospital March 13, 1920, suffering from long-continued intestinal obstruction.

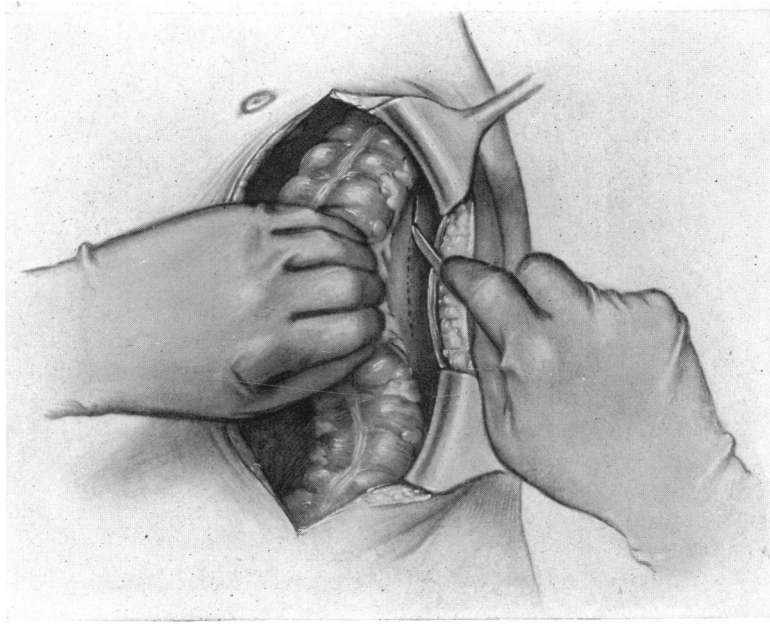

FIG. 2.—Incision of outer leaf of peritoneum beside descending colon so as to secure suitable mobility of that part of colon.

She stated that she had been in excellent health until two months ago when she had cramp-like pains across the abdomen, especially in the lower left side. These were severe and were accompanied by constipation. She went for two weeks with very slight fecal passage. Large quantities of fæces then passed and she was relieved. For more than two weeks she then had suitable bowel movements.

On admission she stated that the last bowel movement had occurred twenty-six days ago. During that time she had eaten very little, but had taken various forms of broth. She had suffered much from abdominal pain, but had vomited very little, excepting after taking castor oil. Occasionally the return from the enemas had been blood-tinged. Just before coming to the hospital severe

vomiting had begun and hence she sought immediate relief. She was in reasonably good general condition. Heart and lungs, sound; abdomen distended; visible peristalsis; no tumor palpable either by examination or by rectum.

Description of Operation.—The details of the operation for this patient are shown in the accompanying plates. They give a fair indication of the average procedure.

1. *Primary Incision.*—A low, five- or six-inch incision, near the median line, gives opportunity for suitably exploring the abdomen,

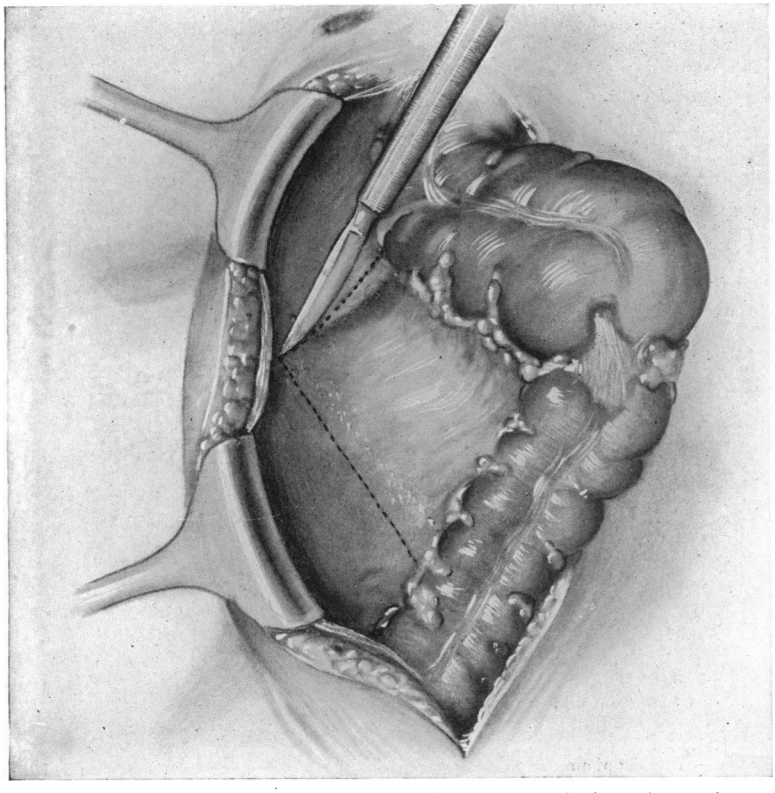

FIG. 3.—Exposure and removal or mobilization of enlarged lymphatics and part of meso-sigmoid.

learning the site and character of the primary lesion, and searching for metastases and lymphatic enlargement. With or without enlargement, it also permits the mobilization of the growth in operable cases. Figs. 2, 3, and 4 indicate the portion of work which was done through this incision in this case.

2. *The incision of the outer leaf of the peritoneum of the descending colon,* as advocated by Moynihan and others and as indicated in Fig. 2, is easily accomplished and secures wonderful mobility of the corresponding portion of the intestine. When carried upward sufficiently, it permits the mobilization of the splenic flexure.

3. *Removal of Lymphatics.*—It is desirable to examine the lymphatic areas which are liable to infection. Jameson and Dobson[1] have carefully investigated the anatomy of these areas. It is not always practicable to completely remove them, nor is it always necessary. Numerous observers have shown that cancer of the colon may long remain a local disease. Clogg[2] made post-mortem examinations in eighteen patients with cancer of the pelvic colon. Enlarged lymph-nodes were noted in seventeen instances, but only

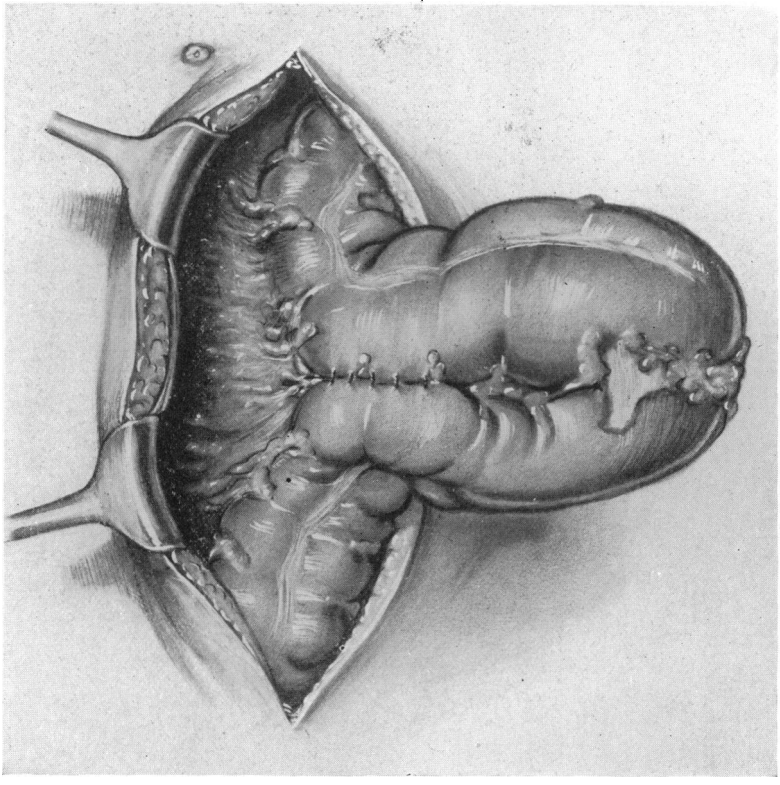

FIG. 4.—Stitching of afferent and efferent legs of intestine so as to form a septum which is suitable for later clamping.

in six were they at a distance from the colon. He found that enlarged lymph-nodes did not show cancer cells in one-third of the cases examined. The judgment of the individual surgeon must determine the extent of the lymphatic area which is to be removed.

In this instance the small intestines were retracted to the right and the mesocolon was exposed as far as the spine, the peritoneum was incised, and the lymph-nodes were mobilized and either removed at once or pushed toward the sigmoid. Branches of the left colic and inferior mesenteric arteries were clamped, tied, and cut, but the

[1] Proceedings of Royal Society of Medicine, 23, 1908–1909, Surgical Section, p. 149.
[2] H. S. Clogg: Cancer of the Colon. Lancet, 1908, vol. ii, p. 1007.

main trunks of both of these arteries were preserved. A sector of the peritoneum, with apex at inferior mesenteric artery and base at the sigmoid, together with the adjacent lymphatics, was mobilized

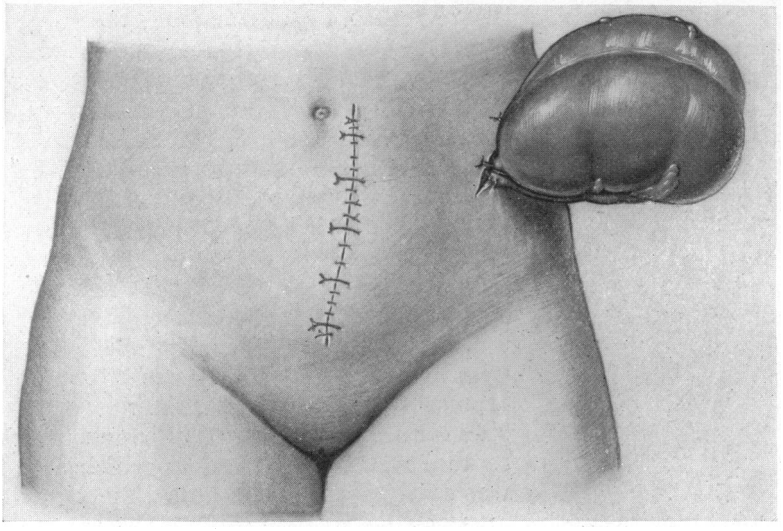

FIG. 5.—Primary wound closed. Diseased intestine delivered through small secondary intramuscular wound. (In this instance it was distended by pressure of gas from above.)

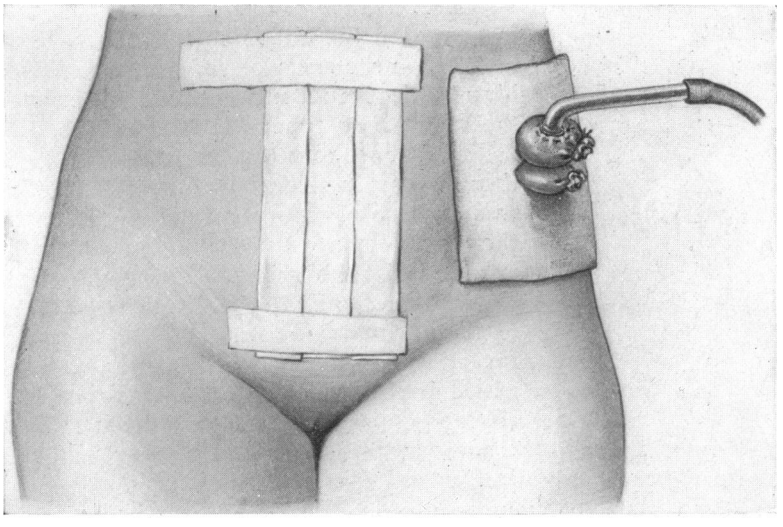

FIG. 6.—Primary wound covered by aseptic dressing. Secondary wound smeared with ointment and protected by gauze. Protruding parts of afferent and efferent intestine ligated. Diseased portion of intestine ablated. Paul's tube inserted in protruding part of afferent intestine so as to secure and temporarily control drainage.

and pushed to the sigmoid. The breadth of this sector must vary somewhat with the individual case. Since the lymphatics extend along the intestinal wall to the next afferent arterial branch, it is desirable to remove a corresponding portion of the intestine, with its ad-

jacent arterial loops, and the incision in the mesosigmoid should be large enough to permit this.

The real point at issue is that in the two-stage operation the extent of lymphatic dissection and the length of the removed portion of intestine may be as great as in the one-stage anastomosis. Tension is to be avoided in any instance, but the danger of moderate tension is not so great in the two-stage procedure as in the one-stage procedure. Unless the abdominal wall is unusually thick, patients who give suitable facilities for one-stage anastomosis are likely to give equally good opportunity for two-stage procedure.

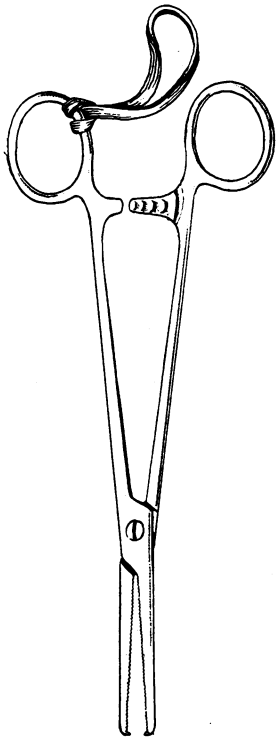

FIG. 7.—Clamp for dividing the "spur" by pressure. At first the pressure was secured by a rubber band applied to the handles: afterward the ratchet is used for progressive tightening of the clamp.

4. *Stitching of Afferent and Efferent Legs of Intestine so as to Secure a Good "Spur."*—Sound portions of the afferent and efferent legs of intestine were selected at safe distance from the cancer and stitched together with fine catgut for a distance of two inches or more. This secured suitable apposition between these portions of intestine. A good septum was thus formed to which a clamp was safely applied at a later time.

5. *Exteriorization of Cancerous Portion of Colon.*—This is best accomplished through a small separate incision at a convenient site. In this instance finger pressure was made from within the abdomen a little above and internal to the anterior superior spine of the ilium and a small intramuscular incision of the McBurney type was made there. The diseased loop of intestine was then drawn through this incision. In this instance there was so much gas pressure from above that the extruded intestine "ballooned up" like an inflated rubber bag. The edges of the skin were stitched to the intestinal wall.

The primary incision was then closed in layers and covered with a small, sterile, gauze dressing. This in turn was completely covered in with strips of adhesive plaster which extended onto the surrounding skin. In this way healing of the primary wound by first intention was secured.

The small size of the new incision and the undisturbed condition of the tissues about it leave little likelihood of mural abscess about the stoma.

6. *Treatment of Excluded Portion of Colon.*—After the skin and adjacent portion of colon have been well smeared with a 10 per cent. boric acid ointment, gauze is laid about them.

We now have the abdomen shut off. Since the intestine has not been opened, there has been little likelihood of infection. In

Mikulicz' early cases the loop of cancerous intestine was permitted to slough in the dressing. This, however, was not done in his later cases and is unnecessary. A ligature can be placed about each loop of intestine outside the gauze dressing. The cancerous loop of gut can be ablated. The time for opening the protruding intestine depends upon the condition of the patient. In some instances it may be deferred for forty-eight or even seventy-two hours. In this instance, owing to the pressure of gas from above, an immediate opening was desirable, therefore a purse-string was placed in the upper leg of intestine between the ligature and the gauze dressing, a Paul's tube was inserted and held fast by a tightening of the purse-string. This permitted gas and fæces to escape without soiling the

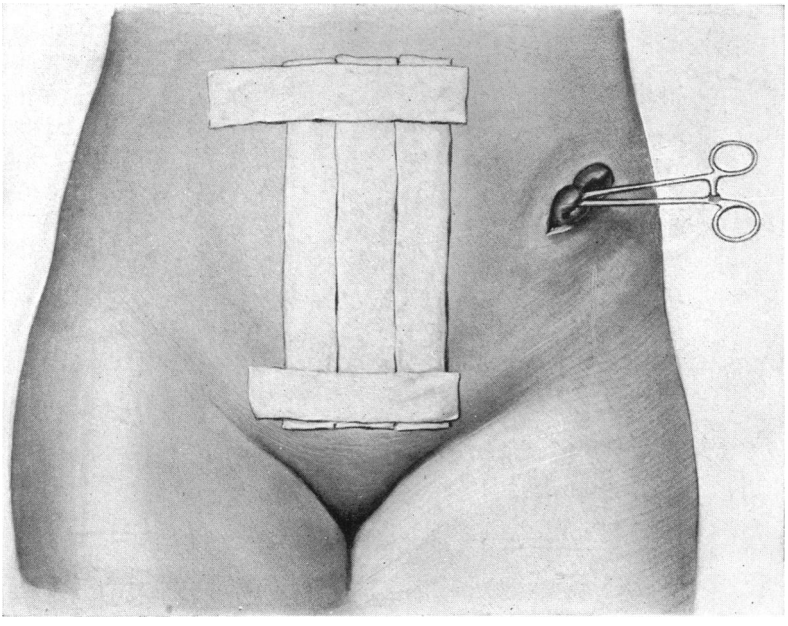

FIG. 8.—Clamp applied to septum.

dressing. The purse-string joint held for twenty-four hours, which was sufficient to permit a reasonably good union between the abdominal wall and the intestine and thus prevent infection at that point.

7 and 8. *Clamping of the Spur.*—The ligatures about the ends of the intestine were removed after forty-eight hours. A "double-barrelled" intestinal stoma was thus established which provided an exit for the intestinal contents. After nine days the union of the abdominal wall was firm. There was no evidence of surrounding inflammation there and the crushing of the spur between the two legs of intestine was begun. Various clamps have been used for this purpose. The one which bears the name of Mikulicz is believed to be a very efficient one. We have tried various forms of clamps and, at the present time, use an ordinary Kocher clamp (Fig. 7), or a

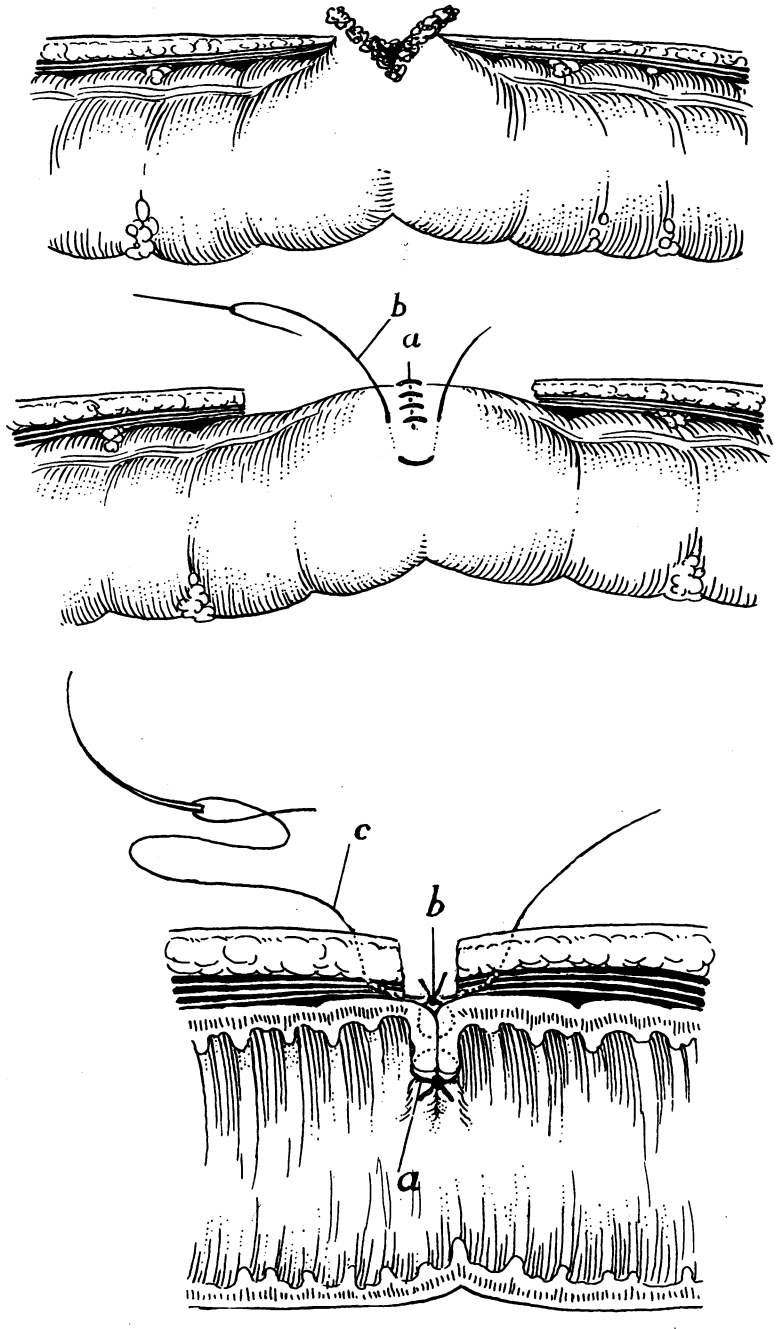

FIG. 9.—Closure of stoma. The intestine is separated from its attachment to the abdominal wall so as to expose its peritoneal surface. The lower leg is then pulled upward and the upper leg downward. Interrupted chromicized gut stitches (*a*) are taken through the entire intestinal wall at the upper and lower edges of the stoma and tied with their knots inside the intestinal lumen. This row is then reinforced by Lembert stitches (*b*). The edges of the abdominal wall are then approximated by silkworm-gut stitches (*c*), leaving provision for possible leakage.

similar clamp without teeth at its end. After inserting fingers on each side of the septum so as to determine the relationship of the parts, the clamp is applied and an elastic band applied about the handle so as to make firm pressure. At the end of one or two days the first notch of the ratchet was fastened. On successive days, additional pressure was applied (Fig. 8) and the clamp came away on the fifth day. In this instance the artificial anus discharged intestinal contents regularly and the mouth of the stoma contracted moderately.

9. *Closure of Stoma.*—On the twenty-fifth day an effort was made to close the stoma. The skin was dissected away from the margin of the intestine. The upper leg was pulled downward from above (Fig. 9) and the lower leg was pulled upward from below, thus securing enough intestine for good serous apposition of the ends. The peritoneum was slightly opened for this procedure, and the edges of the peritoneal opening were easily secured by a few catgut stitches. The first row of stitches was then taken between the intestinal ends. They were interrupted, chromic gut included the entire intestinal wall, and the knots were tied inside the lumen. A second row of Lembert stitches of chromic gut was then taken to secure apposition outside of the first row. The edges of the abdominal wound were then drawn together with silkworm gut, leaving a very small opening for the escape of leakage. In this instance the closure was not complete and after two weeks a clamp was applied to a portion of the spur which remained. After this clamp came away the stoma was again closed by two rows of stitches and the suture line was supported by loose, silkworm gut stitching through the overlying abdominal wall. The wound then closed satisfactorily and the patient left the hospital May 26th. The period of her operation and after-treatment was, therefore, ten and five-sevenths weeks. This was longer than a successful one-stage operation would have taken. A one-stage operation, however, was not to be considered for this case. The intestine was too greatly distended and contained too much foul fecal material. A preliminary colostomy and later one-stage operation would probably have taken longer and would have been much more dangerous.